ONTARIO

FISH AND WILDLIFE REVIEW

Vol. 1, No. 2

Fall, 1961.

ONTARIO

ONTARIO DEPARTMENT OF LANDS AND FORESTS

HON. J.W. SPOONER, MINISTER

F.A. MACDOUGALL, DEPUTY MINISTER

ONTARIO
FISH AND WILDLIFE
REVIEW

Vol. 1, No. 2 Fall, 1961.

Contents Page

Prospects for Duck Hunting in Ontario in 1961 2
by H.G. Lumsden

Legal Aspects of Wildlife Control in Ontario 8
by F.A. Walden

Fisheries Management in Northern Ontario 13
by R.A. Ryder

Spring Deer Yard Surveys and the Outlook for Deer Hunting in 1961 *by H.G. Cumming* 21

THE COVER

Each October, waterfowl hunting attracts thousands to the marshes, lakes and ponds of Ontario. Blustery fall weather and the cold cramped quarters of duck blinds are happily ignored by those who take part in this exciting sport. Our cover picture of a hunter drawing a bead on a fast-flying duck was photographed in the Mitchell's Bay area of Lake St. Clair by R. Muckleston.

ONTARIO FISH AND WILDLIFE REVIEW is published four times per year by the Department of Lands and Forests, Parliament Buildings, Toronto 5, Ontario. Permission to reprint material from this publication is hereby granted, provided due credit is given to the author and this magazine.

LETS GO HUNTING — SAFELY

In the fall of 1957, the Hunter Safety Training Program was initiated in Ontario under permissive legislation, at the request of the game and fish clubs and the individual sportsmen of this province. Then, on September 1, 1960, further legislation was passed whereby it became compulsory for all "first-time" hunters to complete this new course on safe gun handling.

Statistics show that at least 95 per cent of all hunting accidents due to firearms can be avoided if every gunner will acquaint himself with the fundamentals of gun handling and constantly practise them. These fundamentals are simple and serve a dual purpose. First, they help to keep hunting a safer sport, and second, they make for better marksmanship.

While instruction in gun handling is the core of this program, other worthwhile subjects are given to round out a fairly comprehensive course. These include knowledge of game laws, game management and game identification, compass and map reading, hunter-farmer relations and elementary first aid.

This program tries to reach the youngsters before they pick up careless hunting attitudes. Regardless of how you may react to the suggestion that a firearm can be entrusted to young hands, the fact remains that those young hands will naturally seek to hold and use firearms at every opportunity. Youthful curiosity about all subjects and objects, especially guns, cannot be suppressed. It is, therefore, nothing less than good judgement to provide the basic lessons of gun safety, handling, marksmanship, etc., at an early age to the youth of our province. These lessons can easily, economically and safely be taught by all game and fish clubs and similar organizations, to the everlasting benefit of all our sons—and daughters.

Shoot more, hunt more; but shoot and hunt in safety.

PROSPECTS FOR DUCK HUNTING IN ONTARIO IN 1961.

by H. G. Lumsden

In Ontario, duck hunting, except in a few favoured places, does not match the quality to be had on the prairies. Nevertheless, Ontario hunters have a chance of bagging any of 24 species. This does not count varieties which might turn up in an avid wildfowler's bag once in a lifetime.

Ontario hunters are dependent for their supply of ducks to a very large extent on migrants that may have been raised a long way from the settled parts of the province.

Most of the northern and eastern parts of Ontario draw birds from the forests and tundra of the north. Breeding duck densities there are generally very light but, because of the vastness of their area, a large number of birds are involved.

The southwestern part of the province, south of Lake Simcoe, draws substantially on prairie breeding populations but also attracts some birds from the north.

The numerous crises through which our waterfowl have passed, over the years, have provided the impetus for the development of surveys designed to give a forecast of things to come so that management decisions, based on facts, can be made. The mid-winter waterfowl inventory is one of these which, in the Atlantic and Mississippi Flyways, has over the past seven years chalked up more years of decline in duck numbers than of increases. At the same time, the breeding ground surveys on the prairies have confirmed the declines of breeding stock and the production of generally poor duck crops.

Persistent drought has seriously affected water conditions so that the summer of 1961 saw the worst duck breeding conditions since the drought years of the 1930's. These drought

Two redheads and four canvasbacks. Note the concave profile of the redheads. Photo by A. Helmsley.

conditions seem to have extended into the northwestern third of Ontario in 1961. The very severe forest fire outbreak in northern Manitoba and the Sioux Lookout-Kenora part of Ontario reflects this. Water levels are very low this summer throughout that area, and it is possible that duck production will be affected. Water levels, however, are normal over most of the rest of northern Ontario so that duck production is expected to be unaffected. The prairie surveys in 1961 revealed declines in the numbers of ducks remaining to breed, and fewer potholes containing enough water to enable them to bring off broods.

Improvement over 1960 was noted in only very few local areas. All prairie nesting species have suffered as a result of the drought but some species have suffered more than others. The two species which have been hardest hit have been the canvasback and the redhead.

What, then, exactly has happened to these species and what, precisely, has been the cause? Let us examine in some detail the facts available about the canvasback.

The annual mid-winter waterfowl inventory gives us a figure which is not an estimate of population but an index to total numbers. When the indices for a series of years are compared, we can determine trend in numbers and estimate percentage change.

For the canvasback, the peak in recent years was recorded in January, 1954, when the index for the continent stood at 669,000. (Stewart *et al*, 1958)

In 1960, the last year for which complete figures are available, the index suggested that there had been a decline of nearly 70%. This does not tell the whole story for it is apparent that the Atlantic Flyway has suffered a more severe decline than the populations using the other flyways.

What, exactly, has happened to cause this decline? First, let us consider the hunting kill.

Banding recoveries have shown that some canvasback populations suffer close to the highest mortality rate from hunting of any waterfowl species.

Four redheads, one scaup and three canvasbacks. Note the flat profile of the canvasback. Photo by A. Helmsley.

This may be as high as 70 per cent for juvenile birds and 40 per cent for adults. In spite of this, the species seems to be able to hold its own as long as it is able to reproduce at its full capacity, and this depends upon water and vegetation conditions on the breeding grounds.

Canvasbacks choose two main habitat types for nesting. In years when water levels are normal on the prairies, high production occurs in pothole country. Near Redvers in Saskatchewan, Stoudt (1960) reported that pairs and excess drakes use ponds of from two to seven acres for courtship and loafing but that the females actually build their nests on smaller adjacent potholes. The average size of a nesting pond was 1.4 acres but some may be as small as one-tenth acre. In topography of this kind, there may be 60 ponds per square mile. An average of five pairs of canvasbacks per square mile were found there in 1955.

High densities of nesting canvasbacks may concentrate in large marshes, especially in years when drought destroys the potholes as nesting habitat.

Canvasbacks build their nest over water on emergent vegetation. Cattail, bulrush, sedge and whitetop provide the most widely used nesting cover. They may achieve the highest nest success of any species of duck, with nest destruction by predators at a minimum when water levels are fairly high in spring. In drought years, however, when nests are high and dry by hatching time, losses may be very heavy and, in years when water levels are so low that there is no emergent aquatic vegetation, some canvasbacks may remain in flocks and not attempt to nest.

After hatching, hens often lead their broods across country to larger ponds where the young are raised. In dry years, these cross-country movements may be extensive and result in considerable losses of ducklings.

Another unusual factor may affect canvasback production in large marshes. The redhead has a habit of laying its eggs in other ducks' nests. As high as 80 per cent of the canvasback nests in some areas may contain redhead eggs which may make up over half of the total eggs in the nests. Banding crews on the prairies have also found that, in some areas, redhead ducklings may outnumber canvasback young in broods escorted by hen canvasbacks. This type of nest parasitism is far less common in the pothole type of nesting habitat and may not be an important factor in canvasback production there.

The drought has reduced the number of potholes available for nesting canvasback and has precipitated the current crisis. With the return of more normal, wetter years, we can expect the potholes that again hold water to produce birds. However, this number is declining all the time. Drainage, to increase crop acreage, poses a real threat to future canvasback production and, indeed, to all prairie nesting ducks. Unless some effective solution can be found, man's direct interference with prairie duck breeding habitat may spell the end to duck hunting as our generation has known it.

Many of the same factors have conspired to reduce the redhead population to a crisis level, and strenuous protective measures are going to be necessary over the next few years to restore these species to a "safe" level.

Providing full protection for redheads and canvasbacks is gravely hampered by the regrettable fact that the majority of duck hunters cannot identify the ducks they shoot. Closing the season entirely will inevitably result in the prosecution of hunters who had not intended to kill redheads or canvasbacks and whose only crime was not being able

Throwing out decoys in preparation for the evening duck shoot.

to tell them from other species. The best solution for this problem appeared to be the inclusion in the bag limit of one redhead or canvasback, but not both. This bird is to be regarded as a mistake bird. All hunters this fall have an obligation to avoid killing any redheads or canvasbacks. In cases where a hunter doubts his ability to identify these species on the wing he should avoid those areas where they congregate.

Results from summer banding have shown that southern Ontario is a fairly important harvest area for canvasbacks. Stewart *et al* (1958) estimated that Ontario ranks ninth out of forty-one states and provinces in magnitude of the kill, and Stewart in Aldrich (1949) reports that, on the basis of comparative number of recoveries, the Lake St. Clair region of Michigan and Ontario is the most important stop-over station along the migration route of the canvasbacks entering the Atlantic Flyway.

Ontario hunters in this area, particularly, have a real opportunity of contributing to the preservation and recovery of canvasback populations by refraining from killing any.

The mallard is without question the most important game duck in most of North America. It gives place to others only in the forested northeastern part of the continent. In the settled parts of southern Ontario, our bag checks have shown that it is outnumbered by black ducks in hunters' bags in the St. Lawrence area, only.

Cringan (1960) has shown that the mallard was not always as common as this in southern Ontario and that it has only passed the black duck in abundance in very recent years. It is now found breeding throughout the area south of the

The loss of ducks through crippling is far too high. The use of dogs for retrieving helps to reduce this waste. Photo by R. Muckleston.

Precambrian Shield. In the area west of Lake Nipigon, there is another breeding population of mallards which also replaces the black duck locally. These two breeding populations have not been affected by drought as their prairie brethren have. Shooting, as far as it depends on local mallards in these two areas, should be little changed from 1960.

Each fall, southwestern Ontario plays host to varying numbers of gadwall, shoveler and lesser scaup. These are largely prairie nesting species and, with the prairie mallards, have been affected quite seriously by the drought. They are likely to be a good deal less abundant than in former years.

Ontario draws its pintail and baldpate migrants from the prairies as well as the north so that these species should show less change in status than the purely prairie nesters.

Although the blue-winged and green-winged teal have an extensive nesting range through Ontario and the prairies, few of the prairie-bred birds pass through Ontario on migration. Blue-winged teal produced in the Great Lakes region seem to drift east before slanting southeastward to their eventual wintering grounds in South America. They are early migrants and often the bulk of the population has left southern Ontario before the season opens.

Black duck breeding habitat has been less directly influenced by man's handling of the land than the prairie nesting species. However, indirectly, the intensive management of beaver has increased the available nesting sites for this species. In spite of this, black ducks seem to be barely holding their own in both the Mississippi and Atlantic Flyways.

During the last seven years, both

flyways have recorded declines more often than increases in the mid-winter inventories. With this species, we cannot blame drought or drainage as a cause of the unfavourable population levels. The high recovery of banded black ducks suggests that heavy hunting pressure may be a possible cause of the decline. More data are needed before we can be sure.

The status of the wood duck in Ontario has been satisfactory over the past ten years. This, however, has not been so throughout the Mississippi Flyway. The declining status and scarcity of wood ducks in the central part of the flyway a few years ago caused the authorities to close the season on this species completely in the United States. With an improvement in numbers, the season has been reopened.

The wood duck is an important game species in some parts of Ontario, making up as much as 25 per cent of the bag. Our populations do not seem to have suffered as a result of hunting; therefore, some liberalization in the limit of one wood duck in the bag per day seems warranted. In 1961, duck hunters will be able to take two wood ducks per day.

Wood ducks are notoriously hard to find during surveys of the breeding grounds and, in Ontario, it has never been possible to predict the crop based on field data. The speed with which Ontario's beaver population reached abundance after the war is probably responsible to a greater extent than any other factor for the thriving condition of our wood duck population. The species is, however, very easy to shoot under some conditions, and we must be vigilant less we lose our birds through overhunting.

The effects of weather on the pattern of duck migration, as well as on local hunting conditions, often decides the quality of duck hunting to a greater extent than the abundance of the ducks themselves. Any forecast of hunting quality must take this into account.

From the point of view of duck abundance, only, the prospects for duck hunters in southern Ontario in 1961 are not very bright.

The drought on the prairies, which has persisted now for several years, has severely hit the prairie breeding populations and has had such a serious effect on some species that it may be many years before restrictions on their kill can be removed.

Hunters in the northern and eastern parts of the province will probably notice little change from 1960 although black ducks seem to be losing ground and may not be as abundant as usual.

The reduced supply of ducks, which is expected, will necessitate a smaller bag limit. Ontario hunters in 1961 will be able to take only five ducks per day; the possession limit will be ten.

LITERATURE CITED

Aldrich, J.W. 1949. Migration of some North American Waterfowl. Spec. Scientific Report No. 1.

Cringan, A.T. 1960. Some Changes in the Status of the Mallard in Southern Ontario. Mid-west Wildl. Conf. Toronto, Dec. 1960. (unpub)

Stewart, R.E., A.D. Geis, & C.D. Evans. 1958. Distribution of Populations and Hunting Kill of the Canvasback. Jour. Wildl. Mgt. Vol. 22, No. 4.

Stoudt, J.H. 1960. Some Canvasback Management Problems. Mid-west Wildl. Conf. Toronto, Dec. 1960. (unpub)

LEGAL ASPECTS OF WILDLIFE CONTROL IN ONTARIO

by F. A. Walden

Those who dwell upon and work the land know the wildlife resource with an intimacy scarcely equalled by any other social group. Wildlife is a product of the land. Its abundance depends upon the fertility of the soil and the way in which the land is used. The importance of wildlife to man has been well known since early times. In its various forms, it has provided food, shelter, clothing, industrial products and recreation, and it has added to the beauty and enjoyment of the landscape throughout the years. The very existence of wildlife has certain social and legal implications to the landowner. Some of these are discussed.

A farmer may have a direct and and voluntary interest in that he participates in the harvest of fur or game from his land. Indeed, he may act to improve habitat conditions for such creatures. On the other hand, recognition of wildlife may be forced upon him, due to the interests of others in this product of his farm.

The relationship of the farmer or landowner, together with certain rights they may possess, is of historical interest. The forest or game laws arose with the Feudal System. Hunting has long been esteemed as a sport for kings and those of high rank who bore arms. When England was conquered by the Normans, the King claimed ownership of all the game whether on private lands or not. This was the opposite to the rights enjoyed by landowners in Saxon times.

Although scarcely mentioned, a Forest Charter was obtained at the same time as the Great Charter, when the barons met with King John. A charter comprises a statement of rights of the people which are acknowledged by the King. Briefly, the game in the royal forests was reserved for the use of the King, but rights were granted to take game in chase (unenclosed land) or in park (enclosed land). No one could take or kill a beast of chase, namely deer, fox or marten, unless he owned a chase or park. Other game, including hares and wild-fowl, was considered to be inferior but could be taken on a franchise, granted by the Crown, which was called free warren. There was an implication in granting these rights that the game would be protected and prosper since the landowner had their sole and exclusive use on his own land. Subsequent Forest Charters have been granted, the last by Henry VIII. The rights expressed have been the subject in detail of many court cases and are now a matter of common law. The right to possess game is inherent in the ownership of the land, and there are many decisions recorded respecting the various circumstances in the possession of game and concerning entry upon private lands to take game.

The common law holds in Canada, as it does in England, but traditionally hunting has taken place fully on enclosed and unenclosed lands. However, increasing human population, particularly in southern Ontario, is giving rise to new interest in rights of hunting and the ownership of game.

The first law protecting game in Ontario was passed in 1821. In 1856, a precedent of constitutional importance was established when an act protecting game was passed by the Legislature.

It stated that this law was made only for Upper Canada. Thus, the concept that game regulation is of local or provincial interest was established for Canada.

In contrast, the British North America Act established that fisheries are of broad interest. Regulations concerning fish and fishing are federal statutes. Although the right to take game, inherent in ownership of the land, exists as described, royalties must be paid on the pelts of certain animals, including beaver, fisher, lynx, marten, mink, and otter. The right is limited to the farmer or his sons resident on the land and cannot be extended or transferred to other persons.

Fish and game laws are provided to regulate means and quantity of the harvest and to provide for the continuing supply of wildlife resources through application of sound management principles. The statutes of direct interest here include The Ontario Game and Fisheries Act, The Fisheries Act (Canada), The Migratory Birds Convention Act, and all amendments to date, together with regulations which have been made pursuant to these acts.

In examining the Ontario Game and Fisheries Act as amended year by year from 1895 to the present, it appears that changes have been gradual. The principles concerning protection of private property, safety and sportsmanship remain the same; changes in seasons, bag limits and matters of management have developed with increasing biological knowledge. The traditional concepts derived from the Forest Charter remain, since a farmer, or his sons resident on the land, may take birds or certain animals in season on that land. However, a royal franchise, better known as a licence, is required to take deer, moose and caribou.

Provision is made for wildlife control in a section of the law which reads as follows:–

"Nothing in this Act applies to a person taking or destroying any animal other than a caribou, deer or moose or any bird, other than an eagle, osprey, vulture, or a bird protected by this Act or the Migratory Birds Convention Act (Canada) on his own lands, in defence or preservation of his property by any means at any time, but he shall within ten days report the pelts of furbearing animals in respect of which there is a closed season to the Department and he shall not offer them for sale or barter during the closed season except under a licence, and any fur dealer possessing the pelts shall hold the licence and forward it to the Department when applying for a licence to ship them out of Ontario or to dress or tan them."

Here it is recognized that wildlife may from time to time cause damage to property or crops, and the landowner is fully authorized to protect his assets by destroying any animal other than deer, moose or caribou and certain protected birds. He should, however, be prepared to prove that damage had occurred. The latter part of the section is for administrative purposes.

Members of the deer family no longer enjoy the status or esteem which accompanies royal prerogative, though their popularity with the majority of hunters is not questioned. The reason they are excepted, where defence of property is concerned, is the fact that there is no universal open season for hunting deer in Ontario, and to permit the landowner the right to defend his property from the intrusions of deer would lead to many questions as to the propriety of legislation which could readily be abused.

Birds protected by the Game and Fisheries Act include ruffed grouse, spruce partridge, Hungarian partridge, pheasant, sharp-tailed grouse, prairie hen, ptarmigan, quail and wild turkey if any now exist in Ontario. Of all these, the pheasant is the only one likely to cause damage to crops or property, though such occasions are sufficiently rare that relief from protection for this bird is not justified.

Destruction of hawks, owls, eagles, ospreys and vultures is forbidden, but crows, cowbirds, blackbirds, starlings and house sparrows may be destroyed at any time.

Although, under the law, the hours are restricted during which guns, rifles and firearms may be used, the restriction does not apply where defence of property is concerned.

Certain migratory birds, including waterfowl, are known to damage crops upon occasion. Provision for protecting crops is made in the Migratory Bird Regulations. In general, the chief game officer for a province may grant a permit authorizing the killing of migratory birds that are causing or are likely to cause serious damage to crops or other interests in particular areas.

Wolves are not protected. They may be killed at any time of the year and a bounty is paid by the province upon application when a wolf is killed. Due to increased interest on the part of sportsmen, bears are now protected by law as a game animal.

Under the common law, no redress is made by the Crown for damage attributed to game which is the property of the Crown.

Some hunters seem to assume that possession of a hunting licence conveys privilege with respect to private lands, although it is stated clearly on the licence that such is not the case. The Game and Fisheries Act deals with this specifically as follows:–

(a) No person with any sporting implement or fishing rod or tackle in his possession, shall enter or allow any dog to enter into any growing or standing grain or any other crop, whether of the same kind or not, without the permission of the owner.

(b) No person in a party of more than twelve persons shall hunt or attempt to hunt or with any gun or sporting implement enter upon any enclosed or unenclosed land in a county without the written permission of the owner or a person authorized by the owner to give such permission.

(c) No person shall hunt or fish or with any gun or sporting implement, fishing rod or tackle in his possession go upon any enclosed or unenclosed land or water after he has had notice not to hunt or fish thereon by the owner either by word of mouth, in writing or by posters or signboards so placed that they may be observed from any point of access to the land.

(d) Nothing in this section limits or in any way affects the remedy at common law of an owner for trespass.

(e) Every person found contravening part (c) above may be apprehended without warrant by any peace officer or by the owner of the land on which the contravention takes place, or by the servant of, or any person authorized by, such owner, and be taken forthwith to the nearest justice of the peace to be dealt with according to law.

Several principles are noteworthy here. Firstly, there is the complete exclusion of the sportsman from standing crops unless he has permission to enter. Secondly, large parties of hunters are excluded from private lands. Thirdly, and of great importance, is the onus upon the landowner to protect his own

This duck hawk (peregrine falcon), along with all other hawks, eagles, ospreys, owls and vultures, enjoys full protection under The Game and Fisheries Act.

land from trespass. The law purposely excludes protection of private property from the duties of a conservation officer. Finally, the right is given for the landowner or his employee to arrest and bring the trespasser before a justice of the peace. In this respect, The Game and Fisheries Act provides more strength to deal with intrusion than the Petty Trespass Act.

All hunting and hunters are affected by acts of vandalism committed by some hunters. The destruction of livestock and property are criminal acts. It is impossible to deal with crime of this kind by juggling laws dealing primarily with game and fish.

Such cases should be reported to the police immediately, whether the offenders are known or not. The record of reported cases of vandalism and destruction shows that these acts are relatively rare in terms of the numbers of hunters entering the field.

Many violations of the Criminal Code committed by hunters are not indictable, and it will be found the police encourage the victim to lay the charge, since the person laying the charge may have to bear the costs if the case is lost. Nonetheless, the Criminal Code and The Game and Fisheries Act provide the means for protecting private property. In Britain and Europe, where there is really tight control over hunting and fishing on private property, there are no conservation officers paid with public funds.

In certain townships, hunting for foxes, rabbits and pheasants is regulated, by means of a township licence. The township must enter into an agreement with the Department of Lands and Forests and must make licences available if the requirement that hunters have a township licence is to be met. An attempt to prevent hunting, by failure to supply licences, would infer that hunting was not restricted in such a township. The obvious great benefit of this licence system is that it limits the concentration of hunters in townships adjacent to the large urban municipalities, and spreads the hunting pressure over a wide area.

The use of pesticides is related directly to wildlife management. While The Game and Fisheries Act prohibits the use of poison to take game, this would not apply in the event that wildlife was killed by means of what is commonly accepted as a pesticide unless intent could be shown. It could be expected, however, that should protected animals or birds suffer unduly due to excessive or negligent use of pesticides, legislation would be sought to alleviate the condition.

Cases are known where rotenone, used in warble fly control, has entered streams during clean-up of equipment. Rotenone is highly poisonous to fish, as well as to other cold-blooded creatures, and speckled trout were lost in the streams as a result.

The act of permitting rotenone, or any substance deleterious to fish, to enter a stream is an offence under the Fisheries Act. Similarly, where poisonous substances are used under the Pesticides Act to fumigate mills or other buildings adjacent to streams or lakes, precautions must be taken to prevent their escape, since failure to do so would be contrary to the Fisheries Act and would imply failure to comply with the Regulations under the Pesticide Act.

The principles of legal controls respecting wildlife include certain rights which go with ownership of the land respecting use of game. Prevention of trespass is provided for, but the onus of prevention is upon the owner of the land. The duty of the conservation officer is to promote the public interest, and he is enjoined not to assume responsibility for private property. Any person may defend his land from damage due to game animals other than deer, moose, or caribou, and from migratory birds, with permission. Game birds, protected by the Ontario Game and Fisheries Act, are unlikely to do damage, though, in the event that pheasants persist in doing damage, the matter should be referred to an officer of the Department of Lands and Forests. Direct action against the birds is illegal. Congestion of pheasant hunters is discouraged by the township licence system.

While no legislation is directly related to preventing damage to wildlife by pesticides, there is a moral responsibility to exercise care in their use. Damage to fish through escape of pesticides into public waters is an offence against the Fisheries Act. The Pesticides Act and Regulations provides for broad standards of care in the use of pesticides.

FISHERIES MANAGEMENT IN NORTHERN ONTARIO

by R. A. Ryder

The need for fisheries management has long been recognized in Ontario, and in recent years this requirement has extended even into the remote hinterland area of northern Ontario. Here, the fisheries resource is used by various bands of Cree and Ojibway Indians as country food for themselves and their dogs. Commercial fishing for southern markets has increased during the past few years, and increased quantities of whitefish and pickerel are being removed from hundreds of lakes in the area.

Processing plants for the filleting, candling and freezing of fish are, even now, being considered for the northern region of Ontario. Only the occasional angler uses the sport fishery at present, but the angling intensity will surely increase with the development of roads, and well-founded management plans will be needed.

By 1959, the need for a fisheries management programme in northern Ontario became obvious and an inventory programme was launched that spring. We hoped that the inventory would cover all of northern Ontario north of the Albany River, between James Bay and the Manitoba boundary, an area of about 135,000 square miles and many thousands of lakes. Obviously, in such an extensive area, each lake cannot be given individual attention.

Consequently, pilot sites were established in 1959 on five lake representative of the waters of the area, and intensive lake and fisheries surveys were done during the summers of 1959 and 1960. These lakes were considered to be typical of all lakes within each geological region, and information obtained from the pilot lakes could be applied on other lakes in the region subjected to the effects of the same climate, geology, forest type and other external forces.

Potential productivity, in terms of pounds of fish per surface acre of water, was established by the analyses of water samples from many of the larger northern lakes, and this information was confirmed at the pilot sites where more intensive studies took place, and where commercial fisheries operations were observed.

For the first two years, North Caribou Lake, Deer Lake and Hawley Lake were surveyed, and basic information was collected for the future management of the fisheries. The fisheries survey at Big Trout Lake was started in 1959 and will be the only pilot site which which will operate continually throughout the study. Fisheries surveys at Sutton Lake began in 1960 and will continue through the summer of 1961. Fishery inventory crews will work on Big Sandy, Wunnummin and Attawapiskat Lakes during the summer of 1961, the surveys continuing for the next two years. It is hoped that, over a period of at least five years, enough information can be gathered from representative lakes of northern Ontario on which to base a suitable fisheries management plan embodying the principles of wise use and sustained yield.

FISHERIES INVENTORY - A fisheries inventory differs from a merchant's inventory in that stock-taking alone is not the only aim. While it is necessary to assess the numbers of fish of the various species available for future har-

Indian commercial fisheries camp at Big Trout Lake.

vest, it should be remembered that this number is constantly changing, and it is necessary to study the causes of this change. Consequently, fisheries inventories entail research to find out the cause of fluctuating fish populations, and require long-term studies if we are to achieve any degree of accuracy. In our work to-day in northern Ontario, many characteristics of the lake environment and external influences on the lake must be understood before their effect on the fish populations can be assessed.

The science of limnology is basic to our work. This science is defined as that which deals with the biological productivity of inland waters and a study of all the influences affecting it. Some of the limnological data which must be obtained, then, are water temperatures, oxygen concentrations, other chemical determinations and degree of water turbidity, as well as the physical characteristics of the lake basin, such as mean depth, area and length of shoreline.

It is often asked why information of this type is needed when the fisheries are our prime concern. A detailed explanation of the theory behind our methods would be too lengthy for a paper of this sort, but a few examples can be cited to explain the relationships between the physical and chemical qualities and the potential fish production of a lake. In general, the higher the mean annual temperature of a body of water, the greater the fish production will be. This results from the longer growing season available when water temperatures have reached the point at which fish actively feed. In our northern Ontario lakes, we have found generally colder water temperatures and a lower fish production rate than in more southerly waters.

Oxygen deficiencies can result in catastrophic winter or summer kills. In this respect, most of our northern lakes have been found to be satisfactory. The degree of oxygen depletion in the lower strata of water is also an indication of the amount of plankton production in the upper thirty feet of the lake. Using this index, most of our northern lakes show a relatively low rate of potential fish production.

The fish production in a lake has been shown to be directly proportional to the mean depth, the total dissolved solids and other chemical levels. An understanding of the geology and climate also allows us to make general statements of potential productivity of lakes on a regional bases. All these and other elements of a limnological survey, when combined with fish population studies, allow us to estimate fish production for any given lake.

The next step is the allocation of the fish production as country food for the natives, to a commercial fishery, to a sport fishery, or a combination of any of these. Wise management practices, then, based on sound investigative procedures, will determine the best ultimate use of the fishery resource and insure a sustained yield for generations to come.

FISH POPULATION STUDIES

Once the physical and chemical characteristics of a lake are understood, fish population studies become more meaningful. Much of our work in northern Ontario is concerned with success of reproduction of the various species, population densities, age and growth information, and food studies. Five major species, pickerel, whitefish, lake trout, pike and speckled trout, have been intensively studied to date. These species are of greatest importance at the present time as a country food, contributing to the commercial fishery or offering potential angling. Other abundant species such as the sucker, ling and forage species have been studied less intensively but cannot be ignored altogether as they are important at least to some degree as competitors or predators of the more desirable species. In 1961, it is hoped that data can be gathered on the goldeye and sturgeon fisheries.

Estimate of standing crop of fishes is one of the more important functions of fisheries inventory work. Fish tagging studies, combined with catch per unit effort data, give reliable estimates of the number of fish of each species in a lake. Usually, where standing crop is at a high level, greater harvests may be taken without fear or overexploitation, providing growth rate is adequate, sufficient annual reproduction occurs and requisite nutrients in the lake are abundant.

Growth rates are determined from scale samples taken from individual fish which are aged and plotted against the length of the fish. Growth rates in our northern lakes appear to be considerably slower than in more southerly lakes, with the possible exception of lake trout. Pickerel, which may enter a commercial fishery from age three to five in a southern Ontario lake, may not reach market-

Running chemical determinations for water productivity tests at Big Trout Lake.

able size until it has reached eight to ten years of age in northern Ontario. This results in a lower potential harvest per acre from northern lakes. Evidence of mature fish spawning only every second year, rather than annually, is apparent in the north; this is particularly so of lake trout.

Food studies enable us to determine the relationship of a fish species to its environment and also to other species. It does not appear that the food habits of northern Ontario fishes are significantly different from those of the same species farther south. However, the shorter growing season reduces the period of active feeding and the amount of annual growth.

Where commercial fisheries exist, a sampling of the catch is desirable to insure that the brood stock is not being overexploited. This information, together with the knowledge of the age and length of the fish at maturity, enables us to set quotas and mesh size of gill nets employed.

Sport fishing quality is measured by creel census which estimates the number of fish per hour of angling that are caught. This rate of capture is phenomenal for certain northern Ontario waters but, because of their inherently low productivity, they could not withstand the angling intensity to which some southern Ontario lakes and streams are subjected.

Shoreline seining enables us to determine the variety of forage species in the lake, as well as to estimate the success of spawning of the game and commercial species. Preserved specimens are sent to the Royal Ontario Museum. This adds valuable information on the distribution of various species of fish in the province.

Plankton, small suspended plant and animal life, as well as bottom organisms, are periodically sampled to augment other data on the productivity of the lake.

RESULTS OF INVENTORY WORK - While the fisheries inventory work in northern Ontario is in an early stage, some information has come to light as a result of the efforts of the first two field seasons. Total dissolved solids determinations from about forty lakes show that, in general, northern Ontario waters are less productive than lakes to the west on the same latitude. The cause of this phenomenon is probably two-fold: (1) the nutrient concentrations in northern Ontario lakes are usually considerably lower than in those in northern Manitoba and Saskatchewan; (2) the growing season in northern Ontario waters is shorter than in waters on a similar latitude to the west. Even within northern Ontario, waters become more productive as you move from the Lake Attawapiskat area towards the Manitoba border. Big Trout Lake has about the same length of growing season as Great Slave Lake in the Northwest Territories, which is on a latitude over five hundred miles north of Big Trout.

We have found that one simple chemical determination from a lake's waters can establish within reasonable bounds the productivity of that lake. This estimate can be improved when modified by other factors known also to affect the lake's productivity.

Fishery productivity is usually expressed in pounds of usable species per acre of water. Such figures in northern Ontario range from one half to three pounds of fish per acre each year. Most of the lakes seem to fall in the narrower limits of one and one half to two pounds per acre. It should be emphasized that this is the annual harvest that may be taken without injuring breeding stock. In contrast, most southern Ontario lakes can yield annually four to ten pounds of of fish for each acre of water.

Growth rates of fishes are much slower in northern Ontario. For example, it takes about four years longer for a lake trout in Hawley Lake to reach a length of twenty inches than it does in Lake Michigan. Southern lakes, however, do not generally lie within the optimum limits of lake trout habitat so it does not necessarily follow that the growth rates in all northern Ontario lakes will be slower. North Caribou Lake, centrally located in northern Ontario, has an extremely fast growing lake trout population, approaching that of Lake Michigan for the first seven years and surpassing it thereafter. North Caribou Lake is extremely shallow, and yet the water temperatures never exceed by much the optimum for lake trout feeding activity and growth. Great Bear Lake in the Northwest Territories, situated about nine hundred miles north of North Caribou Lake, demonstrates the effect of latitude in the reduction of growth rates in lake trout. There, it requires twelve more years for a lake trout to reach the twenty-inch length than it does in North Caribou Lake or Lake Michigan.

Growth rates of lake trout in northern Ontario, then, are not to be considered too seriously as a limiting factor in the production of the area. Rather, the scarcity of fertilizing nutrients which

Experimental fishing with gill nets at North Caribou Lake.

limits the standing crop and the inability of the trout, at least in some lakes, to spawn every year, reduces the production of this species. It may be preferable in many of the lake trout lakes to think of the development of a sport fishery for the future. This may be accomplished by limiting the commercial fisheries in these lakes to a small percentage quota for this species. It is doubtful if lakes other than Big Trout Lake and possibly one or two others, could support long-term sustained yield commercial fisheries for lake trout.

Pickerel growth in Big Trout, Deer and North Caribou Lakes is considerably slower than that in southern Ontario lakes. A twenty-inch pickerel in North Caribou Lake will be five to six years older than a fish of the same length from Lake Erie. Deer Lake and Big Trout Lake pickerel have slightly faster growth rates than North Caribou Lake but still lag behind the rates for southern Ontario waters. Pickerel are second only to whitefish, in terms of tonnage entering the commercial fishery, and probably hold first position in total revenue realized from a single species. Pickerel occur in most of the larger northern lakes in Ontario and offer a potential sport fishery. It does not seem feasible at this time, however, to curtail commercial exploitation of this species to a greater degree than necessary to assure sustained annual yield.

Growth of whitefish in the five lakes studied to-date has been considerably slower than that found in southern lakes. Only in Big Trout Lake do whitefish commonly exceed the twenty-inch length. A sixteen-inch whitefish from Big Trout Lake will usually be seven or eight years older than a similar-sized fish from Lake Huron or Lake Erie. Growth rates in the other four northern lakes, where extensive studies have been carried out, are grouped rather closely around the growth rates exhibited by Big Trout Lake whitefish. It seems, then, that the shorter growing season in the North, combined with the lower concentrations of minerals, seriously affect the growth rates of the whitefish, resulting in lower production quotas. With the likelihood of the establishment of processing plants in the area, making possible a more economical commercial operation, it will be necessary to safeguard the fishery by watching to see that the rate of annual production does not exceed that needed to maintain sustained annual yield.

Pike are found in all of the larger lakes in northern Ontario and are, at present. used mainly as country food for the local people. Some pike are taken commercially where it is economically feasible to use them. When processing plants are established, they will certainly use this species, and quotas will have to be established. Trophy pike can be caught in northern Ontario, and lakes where large pike are consistently taken may be suitable for a sport fishery.

Speckled trout exhibit fair growth in northern Ontario, and certain areas, such as Sutton Lake, should be reserved for sport fisheries. Streams flowing into Hudson and James Bays offer fair to good speckled trout angling, as does the Echoing and Ney Lake region near the Manitoba boundary, and the Fawn River flowing out of Big Trout Lake. With the present costly air travel as the only means of access, only speckled trout or trophy lake trout would be likely to attract anglers to extreme northern Ontario. Pickerel and pike angling, while good, would probably not attract anglers to the far north on its own merits, as fishing for these species is still satisfactory in portions of northern Ontario accessible by road.

PRESENT STATUS OF FISHERIES MANAGEMENT - With the conclusion of each year of inventory work in northern Ontario, we gain a better understanding of the fishery potential, and a better management programme is formulated. The Indians of the region will be given every consideration when a decision is made as to the ultimate disposition of any portion of the fisheries resource. At present, harvest for southern commercial markets and use on the site as country food are the two best uses for this resource.

When access to the north becomes cheaper, the sport fishery will become more important and will merit at least equal consideration with the commercial fishery. Because fish productivity is generally low in northern Ontario, it is not likely that many waters will support both sport and commercial fishing. We must decide which will benefit the people of Ontario the most.

Spring surveys revealed many dead deer in Bonnechere deer yard after the deep-snow winters of 1958-59 and 1959-60. Even unpalatable jack pine was browsed as high as the deer could reach.

SPRING DEER YARD SURVEYS AND THE OUTLOOK FOR DEER HUNTING IN 1961

by H. G. Cumming

White-tailed deer have long been known to gather into deer yards for the winter. These yards are regarded by wildlife workers as potential trouble spots. They reason that if there is any time of particular stress in the life of the deer, it must surely be when the temperature is low, the food in short supply, and movement hindered by deep snow. Any of these factors would tend to decrease the chances of deer surviving the winter. There is a strong suspicion that the crucial one in many cases is the depth of snow they have to endure.

With these theories in mind, members of the Fish and Wildlife Branch of the Ontario Department of Lands and Forests watched with concern the accumulation of snow reported from snow-measuring stations during the winter of 1958-59. When field observations confirmed their fear that deer were having a difficult time, preparations were made to count the numbers of dead deer when the snow melted. This kind of survey had been carried out in other places, notably in Michigan, but the large size of Ontario and the few wildlife staff members available for such a project had always made a similar survey seem impossible here. In the face of the apparent crisis, it was decided to make a try, at least. The experience of that year and the two succeeding ones has shown that full coverage of the province is, indeed, impossible but that much information can be gathered by surveying a few deer yards in each Forest District every year.

A requisite for any spring deer yard survey is a map of the area in which the deer wintered. The problem of how to obtain such a map had been worked out several years previously by Research Branch. It had been found that, although deer could not be counted from the air like moose, the location of deer concentrations could be determined by flying over the forest during the winter and observing places where deer tracks were numerous. Accordingly, during the winter of 1958-59, crews of men in Department aircraft sketched on base maps the location of tracks in the important deer yards of each District. From these maps, plans were made for the spring surveys.

In 1959, the surveys consisted of dead deer counts in each of the selected yards. Crews of three men walked abreast along predetermined lines, examing and recording any dead deer which they found on the survey lines. A count of the dead deer on a systematic sample of the deer yard was obtained in this way. The number of dead deer per square mile and the total dead deer in the yard could then be calculated.

Table 1 shows the dead deer counts for deer yards which were surveyed in each of the past three springs. In most yards, the number of dead deer found, the calculated number of dead deer per square mile, and the calculated total number of dead deer in the yard were very high in 1959 and 1960, but much lower in 1961. This result fits exactly the theory that deep snow has a detrimental effect on deer, for snow station reports indicated that both 1958-59 and 1959-60 were deep snow years, while in 1960-61 very little snow fell. However, other factors must be taken into account.

The first column in Table 1 shows

TABLE 1: COMPARISON OF DEAD DEER COUNTS FOR 1959, 1960 AND 1961.

Forest District and Name of Yard	Yard Size (sq.mi.) and Percent of Yard Searched 1959	%	1960	%	1961	%	No. of Dead Deer Found 1959	1960	1961	Estimated Loss per sq.mi. 1959	1960	1961	Estimated Total Loss 1959	1960	1961
Lake Simcoe															
Wood**	0.8	24.7	1.0	15.0	1.0	15.0	5	3	1	24.4	19.4	6.7	20	19	7
Lindsay															
Harburn**	11.4	10.5	5.4	7.9	5.8	5.1	2	2	0	1.7	4.8	0	19	26	0
Tweed															
Norcan Lake	4.2	24.1	7.0	10.2	9.6	1.4	0	1	0	0	1.3	0	0	9	0
Pembroke															
Aylen Lake	8.7	8.6	8.8	7.5	66	1.9	5	22	2	6.7	33.1	1.6	57	280	106
Bonnechere	31.2*	7.8	21.8*	7.5	82	2.5	54*	61*	12	22.4*	37.3*	5.9	699*	786*	484
Fraser	8.3	8.8	8.3	7.5	9	6.2	7	9	3	9.6	14.4	5.4	80	114	48
Kiosk	9.6	8.6	8.8	8.8	-	-	35	9	-	42.7	11.7	-	376	97	-
Parry Sound															
Shawanaga	4.2	8.1	4.2	9.7	7.8	6.0	7	6	2	20.7	14.7	4.3	87	62	34
McConkey	3.4	9.4	6.3	7.7	4.0	7.4	4	6	2	12.5	12.5	6.7	43	79	27
Squaw L.	8.8	10.0	12.5	6.3	15.9	9.9	10	12	6	11.3	15.2	3.8	100	190	60
Stisted	-	-	4.4	8.1	2.3	11.0	-	0	1	-	0	3.9	-	0	9
North Bay															
Tetapaki**	4.6	15.0	-	-	1.3	10.0	9	-	1	12.8	-	16.7	59	-	23
Temagami**	1.5	14.5	3.4	25.4	2.6	9.2	4	17	2	19.0	19.7	8.3	28	67	22
Bertram**	-	-	2.0	32.4	4.2	11.3	-	14	0	-	21.6	0	-	43	0
Macbeth**	0.2	29.0	-	-	1.7	12.3	5	-	1	23.7	-	4.8	17	-	8
Sudbury															
Massey**	-	-	1.3	37.5	1.5	12.0	-	38	4	-	77.9	15.4	-	101	24

* Not comparable with other figures. Only high and medium density areas of the yard were searched.

** Only a sample of the deer yard (area given) was surveyed.

that many deer yards increased in size in 1961. If the increase in area were due to the fact that the light snowfall allowed deer to spread out over more forest land in their search for food, then the number of dead deer found on a sample area of constant size and the calculated number of dead deer per square mile would be lower, even if the mortality rate remained the same. On the other hand, the large size of some deer yards in 1961 made it impossible to search more than a small percentage of the total area. An overestimate of the number of dead deer in the yard may result when the findings for a small section are applied to the whole yard. This appears to have been the case in the Bonnechere Yard in 1961. In order to overcome these difficulties, the practice of counting deer droppings, known as pellet groups, was added to the surveys as a means of estimating the number of deer in the yards.

The first pellet group counts were undertaken in 1960. To make counting efficient, a long narrow plot, 66 feet long by 6.6 feet wide was used. The centre of the plot was established by stretching out a steel tape for the required length. The width of the plot was then found by carrying a stick, cut to the proper length, with which the distance from the central tape was measured. From the counts so obtained it was possible to work out the pellet groups per acre.

The rate of pellet group deposition was determined from captive deer in Michigan to be 12.7 pellet groups per day. The total number of deer-days calculated from these figures is a measure of the number of deer on the area, times the length of time they were there.

To find the number of deer per square mile, the period during which deer were in the yard must be known. If no other figures are available, the time from leaf fall, when all previous pellet groups would be covered, to the time of the survey is taken as 195 days. Wherever possible, more adequate data are obtained from field observations. Finally, the total number of deer in the yard is calculated by multiplying the number of deer per square mile with the area of the yard as determined by the aerial mapping.

The results of pellet group counts in 1960 and 1961 are summarized in Table 2. Variations in deer densities from one yard to another range from about 20 to 150 deer per square mile. A decrease in deer densities from 1960 to 1961 is evident in most of the yards surveyed. It may be that the decrease was caused by losses during the severe winter or it may be that the reduced snow depths of 1961 allowed deer to wander over a larger area. These findings confirm the opinion that the figures from Table 1 cannot be taken at face value. The real mortality can only be established by comparing the number of dead deer with the number of living deer. When this is done, variations in densities which apply to both figures do not affect the results.

Table 3 shows the number of deer per square mile, the number of dead deer per square mile and the percent mortality for 1960 and 1961. Three different situations can be observed. In the majority of deer yards, there was a great reduction in deer mortality with the coming of a mild winter. This was what we had expected would happen. The surveys show that the deep snow greatly increased the winter mortality of the deer. Some yards, such as the Haliburton yard and the Stisted yard, were low in mortality both years. Obviously, these yards were in southern locations or had enough food and few enough deer so that the herd was not affected by the deep snow. On the other hand, in the yard in Wood

TABLE 2: COMPARISON OF PELLET GROUP COUNTS FOR 1960 AND 1961

Forest District and Name of Yard	Yard Size in Square Miles		Calculated Deer-Days per Square mile		Calculated Deer per Square mile		Calculated Total Deer	
	1960	1961	1960	1961	1960	1961	1960	1961
Lake Simcoe Wood	1.0	1.0	18847	6848	96.7	35.1	97	35
Lindsay								
Haliburton L.	2.7	7.0	5291	4193	27.1	21.5	73	151
Harburn Twp.	5.8	5.8	4183	13678	21.5	70.1	125	407
Pembroke								
Bonnechere	47.0*	82.0	15824	11800	81.1	68.2	3812	5592
Parry Sound								
Shawanaga	4.2	7.8	23131	8506	118.6	43.6	500	340
McConkey	6.3	4.0	13052	5276	66.9	25.7	421	103
Squaw Lake	12.5	15.9	7408	3170	38.0	15.8	475	252
Stisted	4.4	2.3	8517	9671	43.6	49.6	192	116
North Bay								
Bertram	3.2	4.2	21871	9157	112.2	52.3	359	219
Sudbury								
Massey	1.3	1.5	22173	8370	113.7	164.1	148	246

* High and moderate densities only. Not strictly comparable with other figures. (Includes areas under water during dead deer survey).

Township the mortality did not change but was high both years. The probable explanation is that the number of browse plants was inadequate for the number of deer wintering so that there was a high mortality even without deep snow. Similar comparisons should eventually become possible for most of our deer yards. In this way, the yards could be rated as showing little mortality in any winter, mortality in deep snow winters only, or mortality every winter.

To determine the exact nature of the problem in each yard where mortality occurred, browse surveys were added to the spring surveys in 1960. Although browse surveys had been used before on special projects, this was the first time in Ontario that they were attempted over wide areas. The method used was slightly modified from the one developed previously. On the plots marked out by steel tape for the pellet group counts, all available living stems of each species within one foot of the tape were counted. The number of these stems which were browsed by deer was determined. The number of stems which had been mutilated by past browsing or killed outright was also recorded. From these figures, the available browse and the intensity of use by deer were calculated.

Table 4 shows some browse survey

TABLE 3: COMPARISON OF CALCULATED DEER MORTALITY FOR 1960 AND 1961

Forest District and Name of Yard	Calculated Living Deer per sq.mi. 1960	1961	Calculated Dead deer per sq.mi. 1960	1961	Calculated Percent Mortality 1960	1961
Lake Simcoe						
Wood	96.7	35.1	19.4	6.7	20.1	19.1
Lindsay						
Haliburton L.	27.1	21.5	2.7	2.3	10.0	10.7
Harburn Twp.	21.5	70.1	4.8	0	22.3	0.0
Pembroke						
Bonnechere	81.1	68.2	37.3	5.9	46.0	8.7
Parry Sound						
Shawanaga	118.6	43.6	14.7	4.3	12.4	9.8
McConkey	66.9	25.7	12.5	6.7	18.7	13.5
Squaw Lake	38.0	15.8	15.2	3.8	40.0	24.0
Stisted	43.6	49.6	0.0	3.9	0	7.9
North Bay						
Bertram	112.2	52.3	21.6	0.0	19.3	0
Sudbury						
Massey	113.7	164.1	77.9	15.4	68.5	9.4

figures for two yards which were surveyed in both 1960 and 1961. The number of living stems per acre is a measure of the productivity of the yards. The number of browsed stems per acre is used to calculate the percentage of stems browsed, a measure of the present use of browse by deer. In the Bonnechere yard, both the number of stems per acre and the percentage of stems browsed were high. These observations, combined with the results of the pellet group counts, lead us to the conclusion that although deer food was abundant in the Bonnechere yard, it was not enough for the large number of deer wintering there. The resulting mortality was shown by the dead deer counts. Proper management procedure in this case would be a reduction in the number of deer.

In the Bertram yard, there was a much lower number of living stems per acre. Utilization was high although deer numbers were not. The conclusion is that food supplies are too low. The proper management procedure might be to undertake cutting operations in order to open the forest canopy and increase the growth of shrubs and young trees. In many cases, herd reduction and range improvement are undertaken at the same time in order to bring the number of deer and the available food into balance. The browse surveys help to determine which of the two operations is the more important.

Table 4 shows the effects of the population changes outlined above. During the winter of 1959-60, when snow conditions forced deer to concentrate, the percentage of available stems browsed was higher than in the winter of 1960-

61 when the deer could range more widely. In the case of the Bonnechere yard, number of stems mutilated by previous browsing also showed a decrease in 1961. This is the opposite to what we would expect after the previous heavy browsing. It serves to illustrate the fact that our techniques are not yet perfect. Not all findings can be explained but, despite the occasional inconsistency, most of the conclusions from the spring surveys have checked out very well with field observations.

The spring surveys were begun with the purpose of learning more about the status of deer and deer yards, especially during winters with deep snow. An unforeseen dividend has been the information concerning availability of deer for the fall hunt. Prediction of natural phenomena is a risky business at any time and we would hesitate to undertake it without the factual information of the spring surveys. Even with this information, we can only predict the numbers of deer that will be available for hunters. The actual hunter success depends to a large extent upon the weather during the hunting season. If it is favourable, hunters may have good success even when deer numbers are slightly reduced. On the other hand, if the weather is unfavourable, the success can be low even when deer numbers are quite high. The following predictions apply only to the number of deer that will be available. The resulting hunter success may be considerably mofidied by the weather.

The outlook for northwestern Ontario is favourable. No deer yards from Kenora, Fort Frances or Sioux Lookout Districts have been included in the tables because the past three winters have been extremely mild in that area. The deer were so little concentrated that the yards could not even be mapped. Without maps, it is very difficult to obtain any information of value from ground surveys. These mild winters have allowed the deer herd to increase at an alarming rate. Unless hunting can begin to slow down the increase in deer numbers in northwestern Ontario, overpopulation of deer seems inevitable. The sequel will be another die-off of deer similar to those which occurred in 1949-50 and 1955-56. Since deer will be plentiful and the need for hunting great, the slogan for hunters this year should be "go west".

In eastern Ontario, in the Kemptville District, the deer have also benefited from several mild winters. They were affected slightly by the winter of 1958-59 but scarcely at all by the winters of 1959-60 and 1960-61. All evidence points to a good year for hunters in this area.

The situation in central Ontario is more complex. Very few dead deer were found in Lindsay and Tweed Districts, nor in the southern parts of Parry Sound and Pembroke Districts. The surveys in the northern sections of Parry Sound and Pembroke Districts showed heavy mortality in some yards and little mortality in others. The survey findings indicated what the hunting success would be for the past two years. In the southern areas, hunting was considered normal to good. In the northern areas hunting was spotty.

Where the deer yards supplying the deer had above average browse conditions, the deer survived the severe winters and hunting was good. Where browse supplies in the deer yards were not in balance with the number of deer, mortality resulted and the hunters had very poor success. The same hunting conditions will continue with some modifications this year. The reduced snow depths last winter allowed the production of a good crop of fawns. These should help to make up some of the local short-

Staghorn sumac is a favourite deer food. In the over-populated Bonnechere deer yard, winter browsing levelled the sumac at the snow line as if it had been cut by a mower.

ages and increase the number of deer generally available. Hunting should be improved over last year.

In the deer range north of the French and Mattawa Rivers and north of Lake Huron, the effects of the two severe winters were so pronounced that the deer have not yet had sufficient time for much recovery. The spring surveys showed that the North Bay District was more severly affected by the winter of 1959-60 than by the winter of 1958-59. Since a mild winter with little snow was reported in 1960-61 and the spring surveys showed very little mortality this year, we can expect good survival of the deer which escaped the previous winters and a full crop of fawns from this spring. However, the important yearling and two-year-old classes will still be very low due to the mortality suffered in 1959-60. Many of the three-year-old deer will also be missing because of the losses in 1958-59.

Since figures from the fall hunter checking stations indicate that these year classes usually make up the largest proportion of the deer shot by hunters, we expect that the availability of deer in North Bay District will remain low

TABLE 4: COMPARISON OF BROWSE SURVEYS IN TWO YARDS FOR 1960 AND 1961

Yard Name	Living Stems/Acre 1960	Living Stems/Acre 1961	Browsed Stems/Acre 1960	Browsed Stems/Acre 1961	Percent Stems Browsed 1960	Percent Stems Browsed 1961	Percent Stems Mut. 1960	Percent Stems Mut. 1961
Bonnechere	7700	8545	4332	3458	54.9	40.5	11.3	2.0
Bertram	3979	4295	2192	2267	55.1	52.8	1.4	1.5

this year. A good percentage of the deer which are shot will be fawns. More winters with little snow are required to bring about a marked recovery of deer in the North Bay District.

The history of the Sault Ste. Marie District is a little different. The heaviest mortality was in the winter of 1958-59. The winter of 1959-60 was not severe and the winter of 1960-61 was very mild. Because of the heavy losses reported in the spring of 1959, we forecast poor hunting for the past two years. Hunters found the predictions to be only too true. There was an indication from the hunter checks last fall that a large fawn crop was produced last year. With good survival of all deer last winter, another, even better fawn crop should be growing up now. Although the absence of the important two-, and three-year-old classes will mean that low deer numbers are still to be expected, there should be a significant improvement over last year. Many of the deer which are shot will be fawns and yearlings. It will probably require two more years with little snow before the deer in the Sault District begin once more to approach their former numbers.

Sudbury District is about half way between the Sault Ste. Marie District and the North Bay District in the effects of the winters on deer, as well as in geography. Neither of the severe winters was as bad in Sudbury District, but the deer were decimated to some extent by both them. The result is a shortage of young deer from both years. Although much less mortality was observed in the spring surveys of 1961, there has not yet been time for any significant improvement in deer numbers other than the large crop of fawns this year. These fawns will have to produce several good crops themselves before the herd again builds up to its former size.

Manitoulin Island was not severely affected by either winter. It is expected that, with a good winter last year, the deer should be as plentiful as ever. The same should hold true of the Bruce Peninsula which was not much affected by the winters.

All these predictions are concerned with the number of deer that will be available for hunters. Unfortunately, availability of deer is not the only factor affecting hunter success. The weather which hunters experience during the hunting season is another important influence. If snow comes early and tracking conditions are good, the hunters will be able to make full use of the available deer. If the season is warm and dry or with a great amount of rain, the success will be much lower than the number of deer would permit, simply because the hunters are not able to locate and shoot them.

Spring deer yard surveys give us estimates of deer numbers, winter mortality and browse conditions. They also provide a basis for predicting availability of deer in the hunting season. They will become increasingly important in deer management.

Pellet group counts provide estimates of deer numbers; browse counts measure their effect on plants. On a compass line, the plot centres are established by a metal tape; the width is found by using a measuring stick.

DEER PROSPECTS

See Report by H.G. Cumming on Page 21.

Weather is important. If snow comes early, reducing noise and making tracking easy, hunters can take full advantage of the available deer. Photo by F. Richardson.